

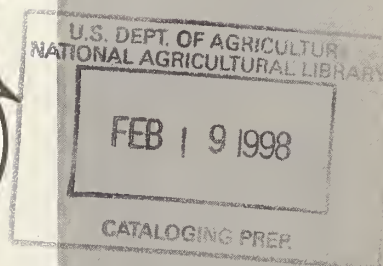
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Series Special Reports

The Agricultural Economy of Lebanon



ERS-Foreign 138

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SUMMARY

Lebanon, a small country about the size of the State of Connecticut, is located on the eastern shore of the Mediterranean Sea. It has a population of about 2 million people; about half of them receive income from farming. Agriculture, however, is not the predominant economic activity. Rather, over 80 percent of the national income is from trade, commerce, and other sources.

Agricultural activities are limited by the country's predominantly mountainous topography which limits the development of farmland. Only about one-fourth of the land is used for crop production. The remainder is mainly used as rangeland for migratory flocks of sheep and goats. Of the cultivated area, more than one-half is terraced land developed along the mountain slopes.

The country has a Mediterranean climate with winter rains and summer droughts. Irrigation systems have been developed through the years; about one-fifth of the cultivated land now receives irrigation water.

Population pressure on the land is great and land prices are high. Most farmers own their own land although their holdings are generally small. The problems associated with large landholdings do not generally exist; instead Lebanon has the problem of small fragmented holdings. Many farms are too small to support a farm family and to provide enough capital to purchase labor-saving equipment, fertilizers, and other items that would increase production.

Crop production falls into 2 general categories--dryland crops and irrigated crops. Generally, the dryland crops are grains and pulses while the high-valued fruits and vegetables are grown with supplemental irrigation.

The production of fruits and vegetables for export has proven to be a profitable enterprise in Lebanon. During the 1950's the area devoted to fruits and vegetables was rapidly expanded, especially that planted to citrus fruits, bananas, and apples. Future expansion will be limited, however, by climatic and soil conditions, availability of irrigation water, and the problem of adequate markets.

A few large dairy and poultry farms which were developed during the 1950's use modern production and marketing methods. These farms market their products mainly in the urban markets of Lebanon. Competition from foreign countries, however, is a major problem and may retard expansion.

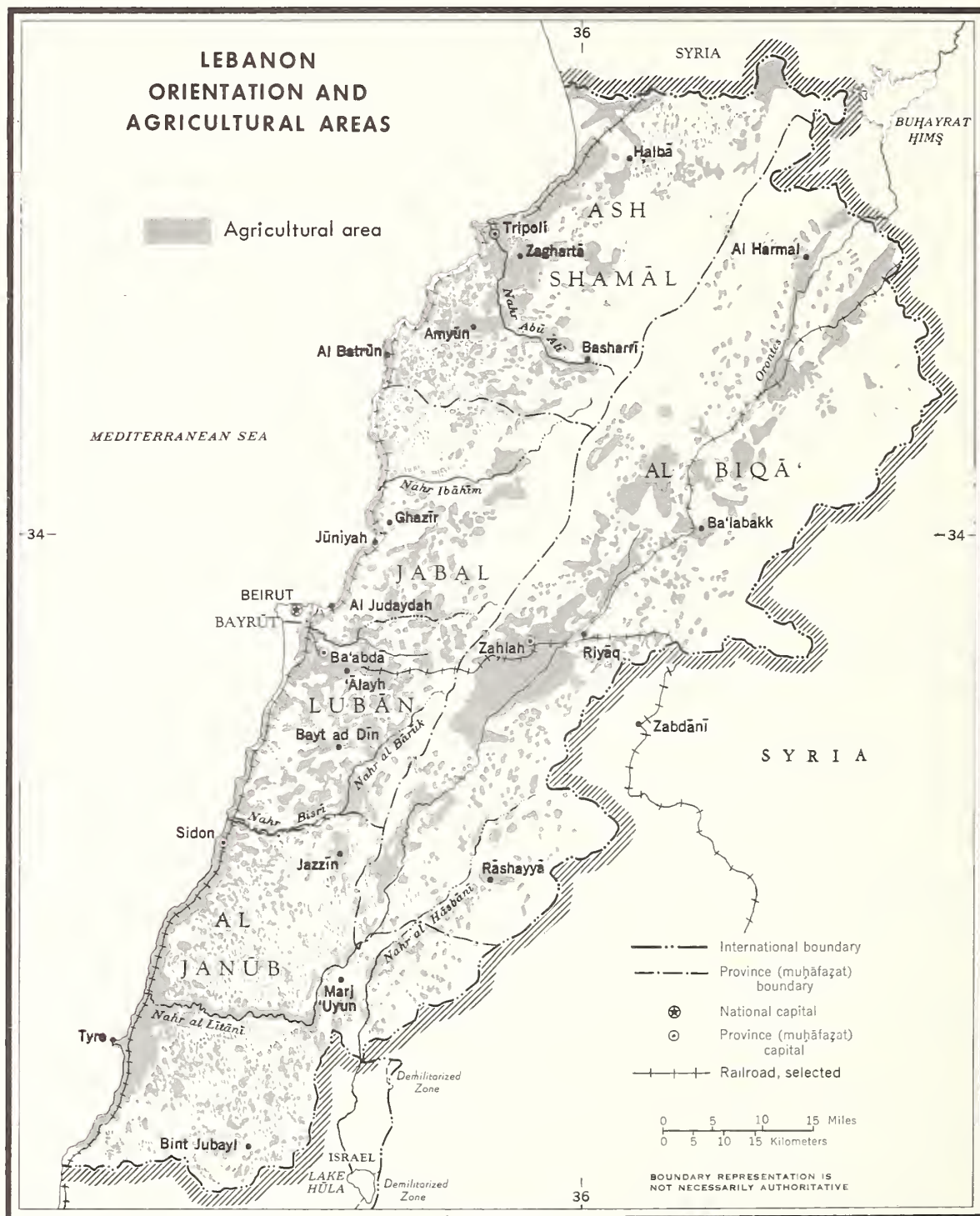
Lebanon is a net importer of agricultural commodities. Grains and live animals for meat are the principal imports although substantial quantities of other foods are also imported. Cotton, wool, and hides and skins are among the nonfood agricultural imports, some of which are reexported.

Agricultural exports are generally about one-half the value of agricultural imports. Citrus fruits and apples are the principal agricultural exports, although vegetables, wool, tobacco, and bananas also rank high. Most of Lebanon's exports go to neighboring Arab countries.

The government's agricultural policy is generally laissez faire. However, some assistance to agriculture is given through various programs--such as price supports, export subsidies, and import quotas--to stimulate production and to develop markets.

Further expansion of farm output is expected over the next few years. Increases are expected mainly in the high-valued crops as more land is irrigated, new techniques are introduced, and new markets developed. Poultry and milk production will probably increase but not beyond a self-sufficiency level. Sustained increases in other

livestock and in field crops are not probable in view of the limited land and water resources. Consequently, the country will have an increasing import requirement for agricultural products, especially grains and livestock products, to meet demand of an increasing population.



THE AGRICULTURAL ECONOMY OF LEBANON
By Ronald E. Kampe, Agricultural Economist
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PHYSICAL FEATURES

Location and Size

Lebanon is a relatively small country located at the eastern end of the Mediterranean Sea. It shares common borders with Syria, on the north and east, and with Israel, on the south and southeast. The country has a land area of 4,015 square miles. It ranges 130 miles along the Mediterranean Coast (about the longest part of the country), and extends less than 65 miles inland at its widest point.

Topography

Two mountain ranges dominate the Lebanon countryside--the Lebanon and the Anti-Lebanon Mountains. Both ranges extend from north to south parallel to the coast. The Bekaa Valley, sometimes referred to as the "breadbasket of the Nation" and called in biblical times the "Granary of Rome," lies between the mountain ranges and is part of the great Rift Valley that extends into Africa.

The Lebanon Mountains, which in some places virtually rise from the Mediterranean, form the eastern border of a narrow but fertile strip of land along the coast. This strip widens in places to form sedimentary plains at the mouths of numerous streams that originate on the upper slopes of the mountains. The largest of these plains is the Akkar Plain in northern Lebanon.

The Lebanon Mountains on the west are characterized by long slopes frequently cut by mountain streams. They rise from the Akkar Plain in northern Lebanon to a maximum height of slightly more than 10,000 feet above sea level southeast of Tripoli (Mount Lebanon). Continuing toward the south the range dips, then rises again east of Beirut to form a secondary peak of about 8,600 feet. From here the range gradually descends until it blends into the hills of northern Israel.

Numerous spring-fed mountain streams on the western slopes are the country's major source of irrigation water. The upper mountain slopes are characterized by porous cretaceous limestone that absorbs winter rains and melting snows. Water works its way down through these porous rocks; when it reaches the impermeable stratum exposed on the lower slopes, it is forced to the surface as springs.

The Bekaa Valley is relatively level, sloping less than 2 percent from the edge of the 2 mountain ranges to the center of the valley. Two major rivers, the Orontes and the Litani, drain this valley. The Orontes flows northward into Syria, and the Litani, southward and westward into the Mediterranean Sea.

The Anti-Lebanon Mountains, which rise on the eastern side of the Bekaa Valley, are not as high as the Lebanon Mountains and are more barren. The tallest peaks, the Jabal al Ithnayn (about 8,600 feet) at the northern end of the range and Mount Herman (about 9,600 feet) at the southern end, help to mark the Lebanon-Syria border.

Climate

The climate of Lebanon is greatly influenced by the Mediterranean, the source of much of the rainfall, and by the Lebanon Mountains, which determine to a large extent the rainfall distribution. As moisture-bearing winds from the Mediterranean reach the

Lebanon Mountains, they deposit much of their moisture on the coastal plain and, as they rise, on the western slopes. On the upper slopes where much of the precipitation falls as snow, the annual average is nearly 60 inches. Along the coastal strip, the precipitation averages 28 inches per year in the south and 35 inches per year in the north.

The Lebanon Mountains cast a rain shadow to the east resulting in much less precipitation in the Bekaa Valley and the Anti-Lebanon Mountains. The eastern slopes of the Lebanon Mountains receive only about half as much rainfall as the western slopes. In the Bekaa Valley, the average annual rainfall varies from 24 inches in the south to about 8 or 9 inches in the north.

Precipitation in the Anti-Lebanon Mountains is not very plentiful except in the high altitudes of the Mount Herman area, where average moisture accumulations exceed 40 inches per year.

Moisture falls mainly during the winter months of December, January, and February. During the summer months of May through September, the country experiences a drought period when only about 5 percent of the annual precipitation occurs.

The Mediterranean Sea and the Lebanon Mountains also affect temperature and humidity. Along the coast where the temperature is mild and frosts are rare, tropical or semitropical crops are grown. Temperatures decrease at higher altitudes, but frosts are not too severe on the western slopes of the Lebanon Mountains because of the tempering effect of the Mediterranean.

Humidity along the seaward side of the Lebanon Mountains is higher than in the rest of the country. However, the moderating effect of sea on the temperature keeps the area from being too uncomfortable. In fact, the western slopes of the Lebanon Mountains are a popular summer resort area.

East of the Lebanon Mountains and in the Bekaa Valley, the climate is more continental. Although average temperatures vary little from those along the coast, winters can be very cold, with temperatures dropping to less than 20° F. Summers are extremely hot and dry with temperatures often exceeding 100° F.

Soils

In general, the soils of Lebanon are poorly suited for agriculture. Steep slopes with thin layers of soil over bedrock are found over much of the country. Good management and extensive use of terraces are needed to preserve this limited soil covering.

Soils of Lebanon are classified into 6 general associations--Lithosols mostly from limestone, Lithosols from marl, Terra Rossa soils, Brown Forest soils, Regosols, and Reddish Brown soils.

The Lithosols, Terra Rossa, and Brown Forest are the shallow, stony soils, located on the mountain slopes. Of the three, Lithosols are the most extensive. Lithosols from limestone are soils of good tilth that are predominantly reddish clays. Lithosols from marl are high in lime content and tend to be soft and floury in texture; they are not as good as Lithosols from limestone as the soil surface tends to crust, making cultivating difficult.

The Terra Rossa soils, although similar to the Lithosols, are located on a slightly more favorable terrain. For this reason, the areas where they are found are more extensively terraced and more intensively cultivated.

The Brown Forest soils are yellowish brown loams and clays. They are neutral to slightly alkaline, with low to medium organic content.

The only really deep, naturally fertile soils in Lebanon are the Regosols and the Reddish Brown soils. The Regosols are alluvial soils which make up much of the coastal plain. Much of this soil is deep reddish clay, although on the outer fringes of the larger coastal plains it may consist of deep sands. Water is usually available for irrigation on the alluvial plains; and except for the deep sands which have a low water-holding capacity, these soils are extensively irrigated. Intensive cultivation of fruits and vegetables is the principal agricultural pursuit in the coastal plain.

Reddish Brown soils are found in the Bekaa Valley. They have adequate plant nutrients, except for nitrogen. Low seasonal rainfall and high evaporation, however, limit their productivity.

POPULATION

The geographic location of Lebanon has influenced the character of its people. For many years Lebanon has been a coastal outlet for traders and travelers from countries beyond its borders. Its people are among the most cosmopolitan and socially advanced in the Arab countries. Women of Lebanon generally enjoy social and political freedom and make up a large part of the urban labor force and of the school enrollment.

Muslims and Christians are the 2 major religious groups in Lebanon, and governmental offices are allocated, by custom, to members of these faiths. Social contacts and functions are largely confined to those of the same religion.

Lebanon's 1964 population was estimated at 2 million persons, which indicates a density of about 500 people per square mile. With only about one-quarter of the land tillable, the population pressure on the land is great. Only about 50 percent of the labor force receive income directly from the farm, and many of these supplement their incomes with nonagricultural jobs.

THE AGRICULTURAL SECTOR OF THE ECONOMY

Agriculture is not the dominant sector of the economy. Over 80 percent of the nation's income is from nonfarming pursuits; services, in all forms, account for the major portion. The Lebanese have a longstanding reputation as traders and merchants, and Beirut, the capital, is well known as an international trading port. In addition, the country's location and mild climate attract tourists, which adds to the national income.

Agriculture contributes about one-half the value of all goods produced within the country. It provides much of the raw material for industry, over half of which is light industry that processes food, clothing, shoes, tobacco, household furnishings, and beverages for domestic consumption. In 1963, over 50 percent of Lebanon's exports were agricultural although the proportion is usually less.

AGRICULTURAL PATTERNS

Land Use

Lebanon has a total land area of approximately 2,470,000 acres. Recent estimates place the cultivated area at approximately one-fourth of the total, or around 640,000 acres (table 1). The remaining area consists of rugged mountains sparsely covered by vegetation and areas where the soils are too poor or too arid for cultivation. Most of this noncultivated land is used as rangeland for sheep and goats.

Table 1.--Lebanon: Estimated crop area, 1958

Crop	Area	Percentage of total
	1,000 acres	Percent
Grains	243.4	37.9
Fruits and nuts	189.4	29.5
Olives	55.6	8.7
Grapes	55.6	8.7
Apples	22.2	3.4
Citrus	19.8	3.1
Bananas	5.3	.8
Other fruit	21.0	3.3
Figs, almonds, nuts	9.9	1.5
Vegetables	51.4	8.0
Potatoes	11.6	1.8
Other vegetables	39.8	6.2
Beans and peas	34.6	5.4
Industrial crops	16.1	2.5
Tobacco	8.0	1.2
Sugar beets.....	1.4	.2
Other industrial crops	6.7	1.1
Forage crops and fallow pasture	107.6	16.7
Total crop area	642.5	100.0

Note: The U. S. Agricultural Attache in Lebanon reports the 1964 crop area as grains 185,800 acres, tobacco 14,800 acres, and sugar beets 4,900 acres.

Source: Food and Agriculture Organization of the United Nations. FAO Mediterranean Development Project Country Report--Lebanon. Rome, 1959.

Of the cultivated area, more than half has been developed over the centuries from rough terrain through the use of terraces, which preserve the shallow soils from erosion and conserve the limited rainfall. The rest of the cultivated area is located on easy-to-develop plains and valleys.

Crops growing in the summer require supplemental irrigation. The amount of land receiving irrigation is estimated to be about 20 percent of the cultivated area, or about 125,000 acres--50,000 acres of terraced land and 75,000 acres of plains and valleys (table 2).

Generally, subsistence crops--winter wheat, barley, and pulses--together with olives, figs, and grapes are grown on nonirrigated land while high-valued fruits and vegetables are produced on the irrigated areas.

Total cultivated area is not expected to increase to any great degree in the near future. Some new land is brought under cultivation each year, but it probably does not exceed the amount of marginal land abandoned because of low productivity. The development of additional irrigation facilities is not expected to increase total cultivated area greatly, as any additional land brought under irrigation would probably be land now dry-farmed.

Table 2.--Land use estimates, Lebanon

Category	Area	Percentage of total
	Acres	Percent
Plains and valleys--		
Irrigated	75,000	3.0
Nonirrigated	221,000	9.0
Total	296,000	12.0
Terraced land--		
Irrigated	50,000	2.0
Nonirrigated	296,000	12.0
Total	346,000	14.0
Forest	182,000	7.4
Other land	1,646,000	66.6
Total area	2,470,000	100.0

Agricultural Zones

Although Lebanon is relatively small, the country is able to grow a variety of crops because of the combinations of climate, topography, soil, and availability of water.

The narrow coastal strip is the most intensively farmed land in Lebanon, especially the central section between Tripoli and Tyre. Here the hot, damp, subtropical climate favors the growing of high-valued citrus fruits, bananas, and vegetables on irrigated land.

In the northern coastal region (Akkar Plain) some citrus fruits are grown, but most of the area is too windy and cold. This region primarily produces grain; much of the land is dry-farmed. The small areas that are irrigated are devoted mainly to sugarcane, peanuts, and some cotton.

There are a number of distinct agricultural zones on the western slopes of the Lebanon Mountains. Where the coastal plain blends with the lower foothills, the olive is the principal crop. Olives are usually grown on unirrigated, terraced land. Warm weather tree crops such as figs and almonds are grown, and also grapes and tobacco where soil and moisture are favorable.

At elevations of 1,500 to 2,500 feet, where a more temperate climate is encountered, stone fruits such as peaches and plums are produced.

The apple zone is at a still higher altitude, where the climate is even more temperate. Favorable apple prices have encouraged farmers to expand this zone into the stonefruit area, but quality apples are more difficult to produce at the warmer, lower elevations. Apples thrive best at about 3,000 feet in Lebanon.

Above the apple zone is an alpine grazing and forest region. This rocky area is not suited for cultivation and in most places is more suited for forest than for grazing.

The Bekaa Valley is the largest farming area in Lebanon, but it is not farmed as intensively as the coastal plain. In the valley, about one-half of the nation's wheat crop and two-thirds of the grapes are produced. Although some land is irrigated, most is dry-farmed. Rainfall is scarce, especially in the northern end of the valley where



Figure 1.--Terraces constructed along the rugged slopes of the mountains

crop farming is marginal. However, where soils are fertile and water is available, intensive cropping is practiced. Tree fruits, grapes, vegetables, potatoes, and onions are the principal crops of the irrigated areas. Farms in the valley are generally larger than those requiring terracing, and use more mechanized equipment.

The Anti-Lebanon Mountains are not very important agriculturally. Some scattered fields of grain are harvested where conditions permit, but much of this cultivated part is held in fallow each year. The area is mainly used as range for the nomadic herds.

Size of Farms and Land Tenure

Farms in Lebanon generally are small and are cultivated by their owners. The hand labor involved in establishing, maintaining, and cultivating the narrow mountain terraces has discouraged accumulation of large plots. Also, the practice of dividing an estate among all the male heirs of the immediate family has resulted in small landholdings, many located in widely scattered areas and some too small for horse-drawn implements. Land prices are high, making it difficult to accumulate enough land for an efficient farming unit. This fragmentation of landholdings is one of the major problems facing Lebanese agriculture. Until ways are found to relieve the pressure for land, it will be difficult for the average Lebanese farmer to raise his level of living.

A typical farmer lives in one of the 1,500 to 2,000 villages scattered throughout Lebanon. He is a member of a closely knit family and community; both greatly influence his attitude and behavior. Traditions and customs are strong. As a result, change comes slowly to the farm and many migrate to the cities in search of an easier way of life.

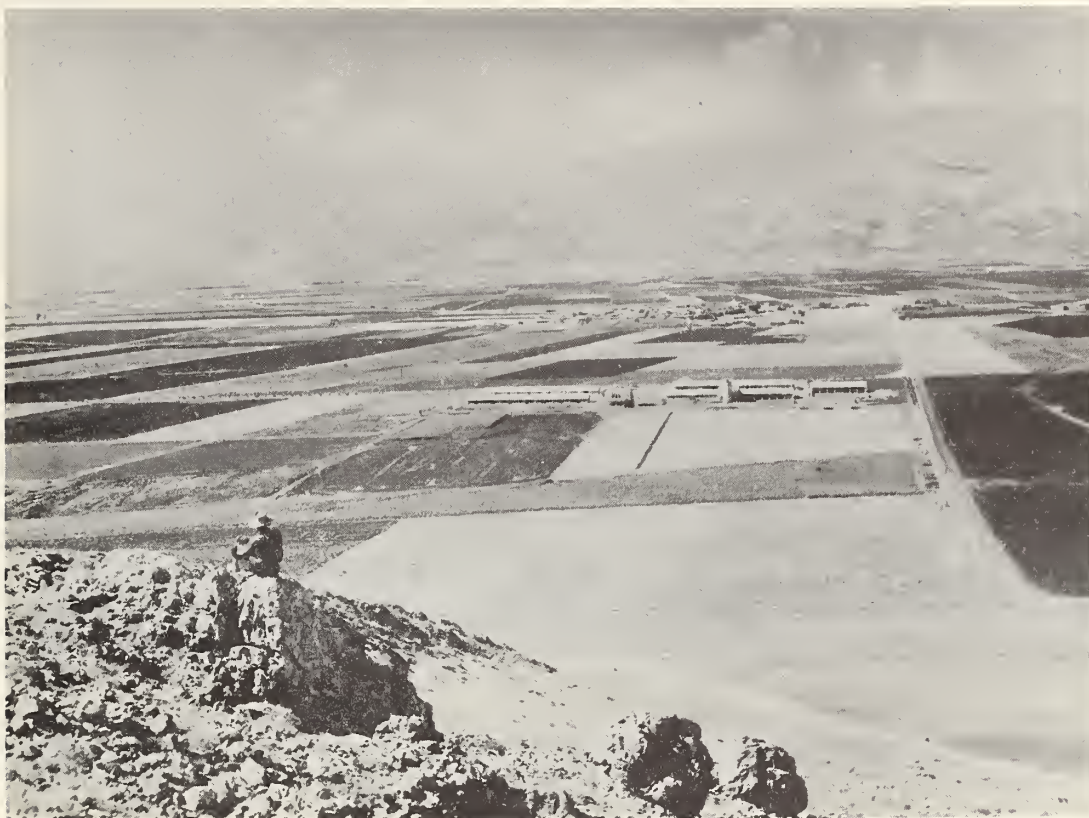


Figure 2.--The Bekaa Valley--known in Biblical times as the "granary of Rome."

A few relatively large farms in Lebanon are mainly grain farms in the Bekaa Valley and the Akkar Plain. It has been estimated that the average holding of the 136,000 farmland owners is less than 5 acres.

Production Practices

Farming techniques and practices vary from those which have been handed down from biblical times to the very latest. Primitive methods are still used on small farms, where the farmer can rarely accumulate enough money to buy additional land, fertilizer, or equipment, or to adopt new techniques. A wooden plow pulled by oxen is as common a sight as are donkeys used for transportation. The hand sickle, winnowing fork, and threshing sled are still common for grain harvesting.

Mechanization

On the larger farms, mechanization has progressed greatly in the past 10 to 15 years, and on some, grain combines have replaced threshing sleds. Many of the more prosperous farmers have modern equipment.

In the early 1950's when farm tractors were still rather new to Lebanon, the crawler type was the most popular. These were used mainly for construction and maintenance of terraces. Today, however, the trend is toward the use of the more versatile rubber-tired tractor, which can be used for transporting products to market as well as for farm work. In 1958, official estimates placed the number of tractors at 320 wheel tractors and 115 tracklaying tractors. The small garden tractor (10 to 12 horsepower) is also becoming popular as it is readily adapted to the narrow terraces.



Figure 3.--Grain harvest on the Akkar Plain. Sheaves of grain are tied together in preparation for placing on the back of a donkey to be carried to a threshing floor.



Figure 4.--Combine harvesting grain in the Bekaa Valley. Modern agricultural equipment such as this is used on some of the larger farms.

Irrigation

Irrigation has long been practiced in Lebanon and many systems believed to have been built by the Romans are still in use. By using irrigation, a farm can produce 2 and sometimes 3 crops per year and also can grow high-value summer vegetable and also fruit crops.

Irrigation water comes mainly from the western slopes of the Lebanon Mountains. Diversion canals are common and in the past were the only means of transporting water. Today, gasoline-powered pumps are also used.

Subsurface water is also used for irrigation, but in lesser amounts. In the past, wells were shallow and tapped only water near the surface; now, deep wells are drilled to lower water sources, thus enabling more land to be irrigated.

Most irrigation water is provided by privately sponsored projects. Additional fresh water is still available, but in most cases its utilization would require major installations, probably best developed by the government. The Litani River project, a multistage project designed for both irrigation and power, is a government-developed project. When completed, it is expected to bring 50,000 additional acres under irrigation. It is estimated that the development of other river basins could bring irrigation water to an additional 37,000 acres.

Cropping Practices

Cropping practices vary throughout the country, from the marginal grain-fallow farming of the semiarid regions to the intensive farming in irrigated areas where a number of crops may be produced in a single year.



Figure 5.--Deep-well drilling in the Bekaa Valley. Irrigation is an important part of Lebanon's agriculture.

Intercropping is practiced, especially in the orchard areas. Fast-maturing crops are interplanted with slow-maturing tree crops, thus enabling farmers to harvest high-value crops while orchards are reaching bearing age.

Use of commercial fertilizer, pesticides, and herbicides has increased rapidly in recent years. High prices have long been paid for barnyard manure, especially for use on horticultural crops. Commercial fertilizer is used mainly by the more progressive farmers, as are herbicides and pesticides. Before 1958, all commercial fertilizer was imported (mostly from France). In 1958, Lebanon began producing its own superphosphate. Consumption of superphosphate, however, is below production capacity. Farmers lack the capital, credit, or incentive to purchase the quantities of commercial fertilizer needed to maximize yields.

Use of pesticides is limited for similar reasons but in this case other problems also exist. Many older orchards have trees planted so close together that a continuous leaf cover makes spray coverage difficult. In other areas, poor spraying equipment or not adhering to spraying schedule or technique contributes to poor spray coverage.

AGRICULTURAL INSTITUTIONS

Research

Research in Lebanon is carried on through 6 research stations--a central station at Tall Al Amaral and 5 substations located throughout the country. Experimental work and research in virtually all phases of agricultural production are being conducted by competent scientists and technicians, and great progress has been made in recent years.

Recent agricultural research has been focused on: Biological control of fruit insects (the Mediterranean fruit fly, the olive fruit fly, scale insects on citrus fruit, and mites on apples), chemical fertilizer experiments on vegetable crops, and feeding trials for dairy and beef cattle. The Ministry of Agriculture is also investigating the possibility of replacing goats with Iraqi sheep. The Fruit Office is experimenting with refrigeration, especially for fresh grapes, as a means of improving their marketing position.

A serious problem, however, is how to reach the farmers with research results; agricultural schools reach only a limited number.

Extension

Lebanon's Agricultural Extension Department was organized in 1954 under the Ministry of Agriculture. It is increasing its scope of operation; in 1964 it operated from 34 regional centers throughout Lebanon. In 1961, the department started publishing agricultural bulletins. These include discussions on the control of plant and animal diseases; poultry, citrus, apple, and almond production; soil analysis; and agricultural cooperatives.

The extension service is improving its organization and its personnel, and is slowly overcoming the reluctance of many farmers to accept the new technology introduced by its agents. This reluctance is partly due to a resistance to change, and partly to a lack of confidence in an agent from a nonfarm background.

In spite of weaknesses of the extension program, research and extension information is reaching some of the villages. In addition, small farmers living near the more progressive commercial farms can observe the results of improved practices and may eventually adopt the methods used.

Supplementing the extension program, the School of Agriculture of the American University of Beirut has conducted demonstrational or experimental projects in villages near the school with encouraging results.

Education

Education has been stressed in Lebanon for many years, and universities at Beirut have been recognized as centers of learning for centuries. Arabic is the language of the country, but French and English are also spoken by many. Official publications are usually printed in both Arabic and French and sometimes in English. Lebanon's literacy rate, estimated at over 80 percent, is the highest among the Arab States.

Agricultural education in Lebanon is offered at the American University of Beirut, the National School of Agriculture in Beirut, and at 3 government training centers located in the rural areas.

A Ford Foundation grant of \$1 million helped to establish the College of Agriculture at the American University of Beirut. The University offers a 4-year course in agriculture and also a graduate program. In addition, the University operates a farm in the Bekaa Valley for research and training of a more practical nature.

The National School of Agriculture in Beirut offers a 3-year course in practical and theoretical agriculture at the secondary school level. Graduates usually find employment in government or agriculturally related industries.

Government training centers offer a more practical 3-year course. Graduates from this course are expected to become farm managers; many, however, seek nonagricultural jobs.

Although most Lebanese recognize the value of education, many of those attending vocational schools are not attracted by agricultural studies. Job opportunities for a man educated in scientific agriculture are limited by the reluctance of farmers to change, and many who can afford higher education are attracted to other fields.

The need for agricultural education, information, and improved managerial practices is evident throughout the country. Some officials believe that more agricultural education at lower-school levels would stimulate wider interest at more advanced levels.

Credit

It is not easy for the average farmer in Lebanon to obtain credit, especially at interest rates he can afford to pay. He has little to offer as security and must rely on expensive loans from private moneylenders.

In 1954, the government, attempting to give credit relief to small farmers and other small entrepreneurs, established the Agriculture, Industry, and Real Estate Credit Bank (BICIAF). This bank and its 2 branches provide short- and long-term loans for agricultural purposes at $5\frac{1}{2}$ percent interest. Over one-half of the BICIAF loans have been extended to agriculture. However, collateral security is required equal to 3 or 4 times the value of the loan. Also, in practice, no chattel mortgages are accepted with the result that most of the loans go to the more prosperous and influential landowners. The numerous small farmers still must borrow from the moneylenders and commercial banks.

The difficulty in obtaining credit has long been a factor in the operating efficiency of Lebanese farms. Use of better seeds, fertilizer, pesticides, and other factors for improving production as well as the acquisition of enough land for an efficient farm, are often not possible because of these high credit costs.

Cooperatives

The Ministry of Agriculture has a Division to encourage and assist agricultural cooperatives. Although the number of cooperatives in Lebanon is not great, the cooperative movement is progressing.

In 1950, only 3 cooperatives existed in the country; but during the next decade the number increased to about 130. Many cooperatives were established for a temporary reason, such as the distribution of free Point Four agricultural supplies, and were not the result of a genuine cooperative movement. The Lebanese trait of placing great faith in individual initiative, strong family ties, and a general dislike of government intervention have not been conducive to the rapid growth of cooperatives and, in fact, brought about the failure of most early cooperatives.

CROP PRODUCTION

The topography, soil, and climate of Lebanon permit a highly diversified agriculture. The value of crop production is estimated at about 80 percent of total agricultural production. Of the crops produced, fruits rank far ahead of other crop groupings. Grains, legumes, and other dry-farmed, low-value crops have declined in importance in recent years, as more land is being diverted to fruit and vegetable crops.

Citrus Fruits

Production of citrus fruits in Lebanon is concentrated on the coastal strip where soils are fertile, irrigation water is available, and temperatures are mild. Citrus fruits are among Lebanon's most valuable crops and as a group are one of its leading agricultural exports.

The amount of citrus production changed little during the 1940's but increased significantly during the 1950's and early 1960's as new groves came into bearing and improved cultural practices were introduced. Production increased about 50 percent during the past decade, rising to an estimated 156,000 metric tons for 1964/65 (table 3).

Oranges are the leading citrus fruit in Lebanon, followed by lemons, tangerines, grapefruit, bitter oranges, and sweet limes. The Shamouti orange is the most popular, making up about 65 percent of the total orange crop.

Intercropping is common in the citrus area, where temperatures are mild and the humidity even. Interplanting bananas with citrus has proven to be the most profitable use of irrigated land, and Lebanon is one of the few places in the world where this is profitable. Generally, climate favoring one crop is not suitable for the other.

Most of Lebanon's citrus groves are small, or part of a "jardinage" or garden culture, ranging in size from 2 to 10 acres with the smaller holdings in the majority. Orchards of 10 acres or more are rare. By using the garden-culture method--interplanting a citrus with other irrigated crops--it is common for a family to make a living on little more than 1 acre.

The size and shape of many of the terraces plus close planting of trees, especially in older groves, make the use of mechanical equipment difficult, if not impossible. Close planting also prevents adequate spray coverage.

Irrigation as well as proper drainage is necessary for profitable citrus production. Building concrete-lined ditches to bring water to the groves and terracing for proper drainage and distribution of irrigation water are the major development costs. Water brought to the groves is usually distributed to basins formed around the trees.

Table 3.--Lebanon: Estimated production of selected agricultural commodities, average 1952/53 and 1954/55, annual 1959/60 through 1964/65

Commodity	:1952/53: :1954/55: :average:	:1959/60	:1960/61	:1961/62	:1962/63	:1963/64	:1964/65 ^{1/}
1,000 metric tons							
Wheat	54	25	20	35	50	45	40
Barley	19	4	4	8	10	10	8
Corn	12	2	2	3	2	2	2
Sorghum	7	3	2	2	2	2	2
Beans and peas ...	2	3	1	2	3	5	5
Potatoes.....	37	32	30	36	60	70	65
Peanuts, unshelled.	1	2	2	2	2	2	3
Tobacco	3	4	4	4	3	4	5
Sugar beets	0	5	14	22	30	30	80
Oranges	68	75	71	96	98	103	110
Lemons	^{2/} 35	18	40	27	33	38	42
Other citrus.....	--	4	4	4	4	4	4
Apples.....	26	52	47	79	73	71	85
Bananas.....	17	18	22	21	25	26	18
Grapes	79	50	70	90	85	80	85
Figs, fresh	9	8	5	7	8	6	6
Olives	42	28	38	43	31	50	35
Onions	35	33	23	8	40	30	15
Meat ^{3/}	25	29	27	29	31	29	32
Milk ^{4/}	46	70	68	69	80	87	96
Eggs	2	3	2	2	4	5	5

^{1/} Preliminary. ^{2/} Includes other citrus fruits. ^{3/} About 50 percent beef and veal, 35 percent goat, 10 percent mutton and lamb, and 5 percent other meat. ^{4/} About 49 percent cow, 46 percent goat, 4 percent sheep, and 1 percent buffalo.

Harvesting of citrus fruits usually starts in September and is completed before July. Modern packing houses have been in operation since 1960, the year the Fruit Board assumed control of fruit exporting. The Fruit Board exports fruit on a consignment basis for growers, speculators, or exporters. A partial payment is made by the Board upon receipt of the fruit, and final payment is made no later than July of the same marketing season.

One of the recognized needs of the Lebanese fruit industry is more refrigerated facilities for transporting fruit over land. Few refrigerated trucks or railway cars are available. However, refrigerated ships are used for ocean shipment. Most truck transportation is accomplished during the winter months when temperatures permit trips of several days.

The Syrian Arab Republic has been, and continues to be, the major market for Lebanese oranges. In recent years, especially since quality has been improved, a larger portion has been shipped to Eastern Europe. Although production will probably continue to expand, the future of Lebanon's fruit industry appears to be based on its ability to improve the quality of present production in order to expand exports to the higher valued European market.

Bananas

The Lebanese grow the Canary Island Dwarf Cavendish banana which was discovered in Indochina's high mountains. It is well adapted to the climate in Lebanon and can withstand relatively low temperatures.

Banana production has increased greatly in recent years with most of the increase being exported to neighboring countries, mainly the Syrian Arab Republic, Iraq, Jordan, and Iran. Production increased from 17,000 metric tons in 1952/54 to a high of 26,000 metric tons in 1963/64.

Olives

Olive production dates back thousands of years; some trees reported to be over a thousand years old are still bearing fruit. Olives are grown throughout Lebanon, mainly in nonirrigated areas on the lower slopes of the Lebanon Mountains.

About 10,000 to 11,000 metric tons of olives are consumed each year as fruit and the remainder of the crop is pressed for oil. Olive oil is the main cooking oil used in Lebanon and comprises about half of all oil consumed. Lebanon is usually a small net exporter of olive oil, although in some years it may import a greater amount.

Production varies from year to year due to the fruiting characteristic of the olive which usually results in a good crop every second year. Weather conditions also affect yield as the crop is dependent on rainfall and usually receives no supplemental irrigation.

The Soury variety appears to be the best adapted to the country and comprises about two-thirds of all olives grown.

In an effort to eradicate the olive fruit fly that causes heavy damage to the olive crop, the Ministry of Agriculture distributes technical bulletins on the subject and makes insecticides available to farmers.

Apples

Apples are the most rapidly expanding fruit crop in Lebanon. From a 1935-39 average of only 2,000 metric tons, production has increased to an estimated 85,000 metric tons in 1964.

Most of the apple orchards are located on the upper slopes of the Lebanon Mountains at elevations around 3,500 feet where a cooler climate favors production of high-quality apples. Favorable prices in recent years have tempted farmers to plant apple trees at lower altitudes, where production is more difficult.

Insects and fungus cause extensive damage each year, but progress is being made in controlling these pests.

Harvesting, which starts in July, is usually completed by September. The fruit is transported to cold storage plants where it is graded and stored. It appears that Lebanon has adequate storage for apples at present, as, reportedly, 46 cold storage plants with a total capacity of about 87,000 metric tons were in operation at the end of 1960.

Only in recent years has modern grading and packing equipment been used. Previously, all apples were graded and packed by hand, and a foreign buyer could never be sure of the fruit's quality. Today, government officials and fruit exporters have introduced a system of grades and standards. This system, together with the use of

the modern grading, packing, and storage facilities, helps to maintain the uniform product needed to expand the export market.

The most popular apple varieties grown in Lebanon and found in foreign markets are the Golden Delicious and Red Delicious. However, most of the varieties grown in the United States also grow in Lebanon.

Grapes

Grapes, like olives, are grown throughout Lebanon but are mainly concentrated in the Bekaa Valley where about 70 percent of the crop is grown.

The Lebanese consume all their own grape production and usually supplement it with imports. About 50 percent of the crop is consumed as fresh grapes while the remainder is processed into alcoholic beverages, molasses, and raisins.

Production increased from a prewar (1935-39) average of about 50,000 metric tons to an estimated 85,000 metric tons in 1964. Modern methods of cultivation in addition to a greater use of improved varieties have been largely responsible for the increase. Many farmers, however, still cling to the traditional production methods.

Figs

Figs are an important domestic food crop grown throughout Lebanon. Production has not increased in recent years and remains constant at around 6,000 to 8,000 metric tons. Most of the crop is consumed locally either as fresh or dried figs. Small quantities of dried figs are exported to neighboring countries but these are generally offset by about an equal amount of luxury-packed figs that are imported. The quality of Lebanese figs is generally not too high by western standards as the method of drying consists of halving the figs and drying them in the open air on straw mats, exposed to insects and dust.



Figure 6.--Grape production in the Bekaa Valley. Grape vines are supported close to the ground by short sticks.

Other Fruits

Lebanon produces substantial amounts of deciduous fruits other than apples, grapes, and figs. Of these the peach, pear, apricot, cherry, and plum have been the most popular. In general, the production of most of these fruits has increased substantially in recent years. However, some fruits such as plums, pomegranates, loquats, and apricots have increased only slightly, while cherries, peaches, and pears have made greater gains. The quince is probably the only deciduous fruit that has declined in popularity.

Wheat

Grains occupy the largest area of any group of crops grown in Lebanon. They are produced almost exclusively on unirrigated land and in areas too arid for other crops.

Durum wheat, the most popular grain, normally occupies about 25 percent of the cultivated area and about three-fourths of the land devoted to grains. Probably a little more than half of the country's wheat crop is produced in the Bekaa Valley where farms are larger and where improved production practices are more extensively used.

Wheat is well adapted to the semiarid lands of Lebanon. It is planted in the fall and harvested during May, June, and July, thus utilizing the winter rains and maturing early in the summer before the effects of the dry season become too severe.

Wheat is the staple food in Lebanon but, though it is widely grown, its domestic production fails to meet the country's needs. As a result, Lebanon imports about 85 percent of its wheat requirement during good years and more during drought years.

Barley

Barley is grown on similar soils and under similar moisture conditions as wheat. It occupies about one-fifth of the area devoted to grains and is produced mainly for livestock feed.

Like wheat, large quantities of barley must be imported to meet domestic needs.

Other Grains

Corn, grain sorghum, and rice are also grown in Lebanon but in small amounts. These grains are planted in the spring and mature late in the summer or early fall and must therefore be grown on land that retains moisture or has supplemental irrigation. They are not of major importance, however, with normal yearly production of about 2,500 metric tons each of corn and grain sorghum and 200 metric tons of rice.

Grain production is not expected to increase significantly in the near future. Some increases in per acre yields may occur as the result of using improved varieties and cultural practices but this increase is expected to be offset by effects of grainland being diverted to more profitable crops. Although the Lebanese governmental policy is to increase grain production, the country will probably have to depend on increasing amounts of imported grain to satisfy domestic demand.

Beans and Peas

Dry beans, peas, chickpeas, lentils, and broadbeans are produced in small quantities and are used mainly for human consumption. These crops are usually grown without irrigation, in rotation with small grains. Production varies from year to year, but Lebanon, on the average, imports about one-third of the amount consumed domestically. Pulses are also a commercial item for the Lebanese, being reexported to neighboring Arab countries.

Vegetables and Melons

Vegetable production, like fruit production, has increased substantially in recent years. It now occupies about 8 percent of the cultivated area, some of which is double-cropped. Most of the production is on irrigated land.

Potatoes, onions, watermelons, tomatoes, and cucumbers occupy the largest area and are the most valuable of the market garden products. Potatoes outrank other products, in value and in area devoted to them, by about 2 to 1.

With the exception of potatoes, tomatoes, and onions, most of the vegetable and melon production is consumed in Lebanon, a significant amount being consumed by tourists. However, there may be good markets for many fresh vegetables in neighboring countries when improved processing and transporting facilities are developed. Until then, foreign exchange earned from vegetable production is not expected to increase substantially.

Tobacco

Tobacco production in Lebanon is under control of a government-approved monopoly which has power to control acreage, purchases, manufacturing, trade, and domestic sales of tobacco. Growing tobacco is considered a profitable business compared with the alternative crops that could be grown on the same soils. This has resulted in production controls in the form of acreage allotments. About 4,000 metric tons are produced annually.

Sugar Beets

Small amounts of crops other than those discussed above are produced in Lebanon; probably the most important of these is sugar beets. Small quantities of sugarcane have been produced for many years on the Akkar Plain and about 300 metric tons of sugar are normally processed from this source. In 1950, however, sugar beets were introduced in the Bekaa Valley, and in 1959 a sugar beet factory was opened. That year production rose sharply to yield 3,000 metric tons of refined sugar, and in 1961 comparable production reached 5,000 metric tons. During 1964, an estimated 80,000 metric tons of sugar beets were produced, which were processed into about 10,000 metric tons of sugar. The Lebanese consume about 40,000 metric tons of sugar annually.

LIVESTOCK PRODUCTION

While production of livestock products is recognized as a very important part of the Lebanese agricultural economy, the size of this production is difficult to ascertain. Not only is most of the production consumed in the local villages where it is difficult to estimate volume, but the relatively free migration of livestock across the Syrian border makes it hard to determine the proportion that is produced locally. Therefore, estimates given for animal products in table 3 should be viewed principally from the standpoint of relative importance of the product.

Cattle

Cattle in Lebanon are customarily used for more than one purpose. Although there are some herds kept mainly for milk production, the typical animal is used primarily as a draft animal, secondarily as a milk producer, and finally, when no longer useful for draft or breeding purposes, is slaughtered for meat and hide. Cattle generally are neither fed nor housed in accordance with western standards and, consequently, stay in rather poor condition. Average annual milk production per cow is estimated at only 400 pounds.

However, since the early 1950's, an effort has been made to modernize the dairy

industry with the aid of U.S. technical assistance. Purebred Holstein cattle have been imported for breeding purposes and a program of artificial insemination has been introduced. Daughters of native cows crossed with Holstein bulls have more than doubled the milk production of their dams.

Modern dairy farms, although still scarce in Lebanon, increased in numbers from 3 in 1952 to 16 in 1957. These farms had an average of 50 cows each. Lebanon lacks good pastureland, and most of the modern dairymen feed their herds in dry lots. Roughage is obtained from the Bekaa Valley or Syria. Some feed concentrates are domestically produced, but many are imported from Syria.

Goats

Milk, meat, skins, and hair are the main products produced from goats. Goats are popular not only because of the products derived from them, but also because of their adaptability to the rocky slopes and their ability to survive on crude vegetation. However, excessive grazing by goats has been largely responsible for the depletion of much of Lebanon's forest area, and legislation was passed in 1950 to restrict grazing. The high rocky forest areas produce little grazing, and it is generally agreed that it would be better in the long run for much of this area to be reforested.

Sheep

Sheep also graze the pasturelands of Lebanon, but in smaller numbers than goats. They are largely of the fat-tailed species and are raised for meat, fat, wool, and milk. Milk is processed into cooking butter, and the fat from the sheep tails into cooking fat.

Poultry and Poultry Products

For years poultry consisted of small farmyard flocks that searched for much of their own food. During the 1950's, there were rapid technical advancements. Today the industry includes a number of modern broiler- and egg-producing farms. Most of these have been financed by businessmen and are large economic units. Lebanon is now one of the leading producers of poultry in the Middle East.

Egg production has risen sharply in recent years. In 1959, a reported 3,000 metric tons of eggs were produced. Three years later in 1962, production was estimated at 4,000 metric tons and estimates for 1963 and 1964 are 5,000 metric tons. In spite of this rapid increase, Lebanon has continued to import eggs.

The production of poultry meat has also been increasing rapidly to keep pace with the increased demand. In 1959, Lebanon produced about 3,000 metric tons, or more than two-thirds of the quantity consumed domestically. Production for 1962 was estimated to be 8,000 metric tons.

The predominant breeds for broiler production are the New Hampshires and White Plymouth Rocks. Rhode Island Reds and White Leghorns are the popular egg-producing breeds.

Except for chickens, little poultry is raised.

Other Livestock

A few hogs are raised and marketed among Lebanese Christians but the hog population is small. Of the beasts of burden, the sure-footed donkey is the most common. Horses, mules, and camels are also used for draft and transportation but are less numerous. The few buffaloes that exist are kept for draft and for milk.

Dairy Products

Approximately 48 percent of Lebanon's fresh milk production comes from cattle, 45 percent, from goats, and the remaining 7 percent, from sheep and buffaloes. About 80 percent of the total milk production is consumed fresh; the remaining 20 percent is consumed mainly in form of white cheese, laban (artificially soured milk), and in industrial baking.

Although domestic production is increasing, Lebanon appears certain to continue to import large quantities of dairy products to satisfy the ever-increasing demand. The Lebanese consumption of dairy products is over twice the domestic production of fresh milk.

Meat

Of the estimated 27,000 metric tons of beef, mutton, goat meat, and pork consumed annually in Lebanon, only a small percentage is produced locally. The imported meat, mainly in the form of live animals (principally sheep, goats, and cattle), comes primarily from Syria and Turkey. Few hogs are imported.

More than half of the animals are slaughtered commercially but refrigeration is scarce and meat must be consumed in a relatively short time. Religious doctrine influences what kind of meat is consumed and how it is prepared. The Muslims eat meat from animals slaughtered according to religious laws, but do not eat pork.

About 2,500 metric tons of meat (mainly preserved) is imported annually to supplement live animal imports.

FOOD CONSUMPTION

Per capita food consumption in Lebanon was estimated at 2,550 calories per day for 1959-61 (table 4). Imported commodities supplied two-thirds of the calories consumed; imported livestock feed indirectly supplied a few others. Over half of the caloric intake comes from grains, primarily wheat and wheat flour. Fats and oils and sugar also contribute significantly.

According to the standards used in the World Food Budget, 1970, prepared by the U.S. Department of Agriculture, the Lebanese diet was adequate during the 1959-61 period with the exception of a slight deficiency in pulse protein. This, however, is expected to be corrected by 1970.

TRANSPORTATION AND MARKETING

Transportation facilities are quite well developed in Lebanon. The country is served by a railroad that connects the cities along the coast, crosses the country from Beirut to Damascus, and extends north in the Bekaa Valley from about the center of Lebanon into Syria. Roads are also being improved for the use of an increasing number of cars and trucks.

The principal means of transporting farm produce to market is by truck or pack animal. Road improvements have enabled a growing number of farmers to use trucks, although many farmers still rely on pack animals as their ancestors did before them. Many farmers cannot afford trucks because their farms are small and are located on the rugged slopes of the mountains.

Marketing facilities for agricultural products are often not adequate. On-the-farm storage is limited and often wasteful. Most of the domestic food supply is processed in the villages where it may not be practical to use modern techniques and

Table 4.--Lebanon: Food balances, 1959-61 average 1/

Product	Supply					Utilization			
	Production	Imports	Exports	Changes:		Nonfood	Total:	Food	
				in	Total:			Per capita	
								Per year	Per day
				stock					
				-1,000 metric tons				Kilograms	Calories
Wheat	27	136	3	10	170	28	142	89.2	855
Wheat flour	--	60	--	--	60	--	60	37.7	363
Barley	5	40	2	1	42	28	14	8.8	83
Corn	2	12	--	-1	15	8	7	4.4	41
Rice, milled.....	--	15	--	-1	16	--	16	10.1	98
Sugar	4	25	--	-11	40	3	37	23.2	246
Potatoes	33	17	22	--	28	6	22	13.8	26
Beans, peas, nuts..	2	14	5	--	11	--	11	6.9	75
Other vegetables..	179	11	17	--	173	37	136	85.4	57
Fruit	275	19	141	--	153	30	123	77.3	140
Beef and veal 2/..	10	--	--	--	10	--	10	6.3	31
Mutton and lamb 2/	9	--	--	--	9	--	9	5.7	21
Other meat	9	4	--	--	13	--	13	8.2	35
Fish	--	3	--	--	3	--	3	1.9	5
Sesame seeds	1	3	--	--	4	--	4	2.5	30
Vegetable oil	15	6	1	-2	22	6	16	10.1	244
Butter	1	3	--	--	4	--	4	2.5	55
Whole milk	69	12	--	--	81	24	57	35.8	88
Cheese	1	3	--	--	4	--	4	2.5	31
Skim milk	19	--	--	--	19	--	19	11.9	13
Eggs	2	3	1	--	4	--	4	2.5	10
Total consumption									3/2,550

1/ Based on an average population of 1,592,000. Excludes alcoholic beverages. Nonfood used includes amounts used for seed, waste, feed, industrial purposes, and extraction rates for grains and sugar. 2/ Includes imports of live animals for slaughter. 3/ Rounded to the nearest 10 calories.

Economic Research Service. Food Balances for 30 countries in Africa and West Asia, 1959-61. U.S. Dept. Agr., ERS-Foreign 119, March 1965.

equipment. But progress has been made in processing and marketing facilities and in techniques especially for export commodities--e.g., cold storage plants and improved grading and packing procedures for fruits. A few modern milk pasteurizing and bottling plants as well as a modern poultry processing plant are now in operation around Beirut.

AGRICULTURAL POLICIES AND PROGRAMS

Lebanese agricultural policy has generally favored laissez faire or, at least, a minimum of government control of economic activities. Subsidies, production quotas, and other measures commonly used in other countries to support agricultural prices and incomes have been applied to some products. Tariffs on agricultural products are more for revenue purposes than for protection of domestic production. Support prices, above the level determined by supply and demand, are applied to only a few crops.

Regulation of Foreign Trade

Most imports of agricultural commodities are subject to tariffs and/or quantitative restrictions. Tariffs fall into 3 main classes--preferential, normal, and maximum.

Most favorable terms or preferential tariffs are generally reserved for neighboring Arab countries. The Inter-Arab Customs and Payments Agreement of 1953 and subsequent agreements between Lebanon, the Syrian Arab Republic, Egypt, and Iraq give each country the privilege of trading with each of the others unprocessed farm products on a duty free basis and processed items with a 25 percent preferential tariff. Wheat and certain other essential foods enter the country duty free, although importers must have import licenses, which are usually easily obtained.

The normal tariff rate is used on imports from most non-Arab countries. The maximum rate is limited to a few nonagricultural products; e.g., maximum rates apply to certain products from Japan.

Although certain essential commodities such as wheat and wheat flour are free of tariffs, a fee of \$6.40 per ton for imported wheat and up to \$31.97 per ton for imported flour is collected by the Wheat Office on imports from countries other than the Syrian Arab Republic.

Most of Lebanon's non-Arab trade results from bilateral trade agreements. Agreements exist between both Eastern and Western countries, with Lebanon showing no preference for either.

Export licenses are needed for agricultural products such as livestock, meat, grain, Egyptian cotton, fats and oils, and sugar. Subsidies are given, subject to cabinet approval, to encourage the export of Lebanese fruit. These include payments on fruit that is graded and packed according to specified standards and partial payment for transportation costs, the amount depending on the port of destination.

Price Support and Quantity Control

The Lebanese Government fixes the price to the farmer for wheat, barley, sugar beets, tobacco, and silk cocoons.

Wheat and barley prices are supported through a program administered by the Wheat Office, a semi-autonomous government organization. Prices were scheduled to be supported during the 1964/65 crop year at a level between \$2.63 and \$2.81 per bushel for durum wheat, depending on class and grade, and between \$2.28 and \$2.46 for semihard and soft wheat. This is the same level of support that was given for the 1963/64 crop. Top-grade barley was to be supported at a level between \$1.16 and \$1.31 per bushel for the 1964/65 crop.

The Wheat Office was organized under the Ministry of National Economy to regulate wheat imports. It was also given the responsibility to buy, sell, and hold wheat in an attempt to stabilize bread prices. In addition, the Wheat Office supplies seed wheat for growers, which can be paid for with wheat when the crop is harvested. The Office's authority to purchase grain to support prices for the growers is designed to encourage farmers to expand wheat and barley production.

The growers' selling price for sugar beets was to be raised on a schedule calling for an increase each year from \$16.30 per metric ton in 1963, to \$19.40 in 1964, to \$21.00 in 1965, and to \$25.80 in 1966. This price guarantee is expected to increase sugar production.

The tobacco industry is controlled by a government-sponsored monopoly which has the authority to control production through acreage control so that the farmer's price falls within a range set up by the Ministry of Finance. In an effort to ensure a market for domestic tobacco, the Lebanese Government has announced certain steps to be taken over a period of time to limit the sale of certain types and brands of imported cigarettes. By 1967, an amount of domestic leaf equal to the tobacco in the

allowed imported cigarettes must be purchased from growers. Imports of oriental-flavored cigarettes have not been allowed since mid-1964.

The Silk Office regulates the prices paid for silk cocoons through a purchase program and is generally responsible for the promotion of silk production. This office is an agency operating within the Ministry of Agriculture.

Development Plans

In 1962, the Lebanese Government announced a Five-Year Development Plan, to be financed partly by royalties from oil pipelines and partly from the regular budget. Projects to provide electricity, to improve water supplies including water for irrigation, and to improve roads to rural villages are the main features. About three-quarters of the \$150 million budgeted for the plan are to be used for these projects.

In 1963, the Government's "Green Plan" was introduced. This plan is for the rehabilitation of agricultural lands over a 10-year period. An initial sum of \$8.7 million was allocated for the project as well as \$12.9 million to be used by the Agriculture, Industry, and Real Estate Credit Bank to extend credit to participating farmers.

Work continues on the Litani Project for developing hydroelectric power and irrigation. As the project proceeds towards completion, more agricultural land is brought under irrigation; when completed, 50,000 acres will have been added to the total irrigated.

Other Aids to Agriculture

In 1959, the Lebanese Government established a Fruit Board, the main function of which was to promote fruit exports. This organization replaced the Citrus Office and the Apple Office. Although the new organization did not have authority to set prices, it aimed at increasing the income of fruit farmers by other means. The Fruit Board regulates the grading and packing of export fruit, promotes the use of cold storage facilities to conserve fruit and thus extend the marketing season, promotes improved orchard management techniques, and promotes the expansion of present export markets and the setting up of new ones.

Subsidies are paid to fruit exporters to compensate for some of the transportation cost, the amount of subsidy being dependent on distance shipped. In addition, the Board operates cold storage and packing plants which help to promote exports.

The Government also finances agricultural research, extension, and educational programs to develop and disseminate new and approved agricultural techniques. Other agricultural assistance provided by the Government includes a bank to provide low-interest loans for agriculture and industry; government-sponsored irrigation projects; rental of tractors, plows, and other agricultural and terrace-building equipment to farmers at a cost covering only operating expenses; free distribution of certain nursery stock to fruit growers; and seed-wheat loans.

Other governmental actions and programs have been adopted in the past, most of which were aimed at increasing agricultural production and expanding export and domestic markets. In some of these programs foreign technicians, mainly from the United States, have assisted in developing pilot projects to demonstrate the feasibility of improved production and marketing practices.

AGRICULTURAL TRADE

Lebanon has an unfavorable balance of trade, with imports usually 5 times or more greater than exports. However, income from tourists, transit facilities, commerce,

and services more than make up this trade deficit.

Agricultural exports are an important part of Lebanon's trade (table 5). Fruit--especially citrus, apples, and bananas--is the principal export; although vegetables, wool, and tobacco also contribute substantially. Neighboring Arab countries purchase most of Lebanon's perishable fruits and vegetables, while the United States and Russia are major buyers of wool and tobacco.

Table 5.--Lebanon: Quantity and value of exports, 1961-63

Commodity	Quantity			Value		
	1961	1962	1963	1961	1962	1963
Agricultural (selected):	- - 1,000 metric tons - -			- - - 1,000 dollars - - -		
Citrus fruit	68.5	87.2	104.3	4,538	4,741	5,608
Apples	45.0	50.3	43.5	5,550	4,975	4,248
Beans and peas	3.0	27.4	26.9	477	3,709	3,892
Cotton	2.8	6.4	8.8	556	2,056	3,119
Tobacco	1.2	2.0	2.6	1,301	2,050	2,504
Wool	1.8	3.9	3.1	1,019	2,208	2,152
Bananas.....	16.4	15.6	12.8	1,712	1,625	1,348
Potatoes	18.5	23.4	30.8	782	1,200	1,129
Hides and skins	1.9	2.9	2.5	747	837	871
Barley	1.6	23.2	1.6	46	1,321	94
Other agricultural				3,766	8,741	10,239
Total agricultural				20,494	33,463	35,204
Nonagricultural				111,584	27,990	30,175
All exports				132,078	61,453	65,379
Agricultural exports as a percentage of total exports:				15.5	54.5	53.8

1/ Value computed at 1 Lebanon pound = \$0.33 for 1961, \$0.32 for 1962, and \$0.333 for 1963.

République Libanaise, Statistiques du Commerce Extérieur, 1961, 1962, and 1963.

In 1961-63, agricultural exports averaged about 35 percent of the value of total exports. But agricultural imports are generally more than twice the value of agricultural exports and usually account for about a fifth of all imports.

The major agricultural imports are live animals for slaughter and wheat (table 6). Live animals come mainly from neighboring Turkey and Syria, and wheat, mainly from Australia and Syria. Lebanon produces less than one-fifth of its wheat and wheat flour requirements. In addition to live animals and wheat, Syria supplies much of Lebanon's cotton, cottonseed, and its imported vegetables and fruit. Syria is usually Lebanon's leading agricultural supplier.

Some imports--such as cotton, beans, and peas--are reexported, especially those that come from neighboring Arab countries. Lebanon is a major shipping country for West Asian agricultural exports.

Table 6.--Lebanon: Quantity and value of imports, 1961-63

Commodity	Quantity			Value ^{1/}		
	1961	1962	1963	1961	1962	1963
Agricultural (selected):	---- 1,000 metric tons ----			----- 1,000 dollars -----		
Live animals.....	^{2/} 757	54.4	52.7	12,930	13,019	13,359
Wheat	128.7	176.9	177.9	6,644	10,250	12,654
Cottonseed	39.8	52.0	52.4	2,925	3,784	4,075
Sugar	30.7	49.1	40.0	1,722	2,648	3,877
Beans and peas.....	12.0	44.8	34.0	1,153	5,824	3,422
Barley	52.7	49.9	54.8	2,084	2,304	3,126
Cotton	5.5	7.9	4.3	3,848	5,618	3,123
Hides and skins	4.8	5.8	7.4	2,113	3,549	2,731
Butter	2.0	2.3	2.5	1,189	1,813	2,215
Cheese	4.1	3.9	4.8	1,961	1,612	1,999
Melons	29.3	36.1	45.1	1,213	1,393	1,959
Rice	16.4	19.1	16.1	1,659	2,151	1,944
Milk and cream ^{3/}	4.5	3.3	4.2	2,004	1,780	1,943
Wheat flour	57.1	35.6	30.0	2,971	2,042	1,887
Wool7	2.0	2.2	428	1,416	1,590
Coffee	3.0	2.7	3.6	1,189	951	1,376
Corn	17.1	18.6	23.9	728	756	1,093
Other agricultural				11,383	17,404	18,196
Total agricultural				58,550	81,110	81,538
Nonagricultural				291,731	254,750	250,328
All imports				350,281	335,860	331,866
Agricultural imports as a percentage of total imports:				----- Percent -----		
				16.7	24.1	24.6

^{1/} Values computed at 1 Lebanon pound = \$0.33 for 1961, \$0.32 for 1962, and \$0.333 for 1963. ^{2/} 1,000 head. ^{3/} Mainly dry milk.

Source: République Libanaise, Statistiques du Commerce Extérieur, 1961, 1962, and 1963.

TRADE WITH THE UNITED STATES

The United States is second only to the United Kingdom as a supplier of Lebanese imports. However, most of the commodities which Lebanon buys from the United States are nonagricultural; agricultural commodities account for less than one-fifth of the total. Of these agricultural commodities, the major ones are wheat flour, animal feeds, and vegetable oil (table 7).

United States imports from Lebanon are relatively small compared to U.S. exports to Lebanon (\$8.2 million vs. \$57.0 million in 1964) (tables 7 and 8). Agricultural imports account for about three-fourths of the total imports from Lebanon. Principal agricultural commodities which the United States buys from Lebanon are wool, tobacco, sausage casings, and sheep and lamb skins.

Table 7.--U.S. exports to Lebanon, 1962, 1963, and 1964

Commodity	Unit	Quantity			Value		
		1962	1963	1964	1962	1963	1964
					1,000	1,000	1,000
Agricultural (selected)		Thou.	Thou.	Thou.	dollars	dollars	dollars
Wheat flour	Cwt.	575	620	511	3,043	3,308	2,763
Feeds and fodders.....	S.T.	8	12	19	917	1,312	2,257
Cotton, unmanufactured..	Lb.	50	294	1,758	14	104	501
Vegetable oils, fats, and waxes, crude.....	Lb.	2,801	3,552	2,532	485	526	448
Fruits and preparations:	-	--	--	--	268	360	364
Other dairy products....	Lb.	147	339	649	88	173	296
Other grains and preparations	-	--	--	--	149	72	259
Vegetables and pre- parations	Lb.	807	1,016	1,204	150	190	258
Rice	Lb.	688	1,057	2,728	63	108	234
Meat and meat products	Lb.	258	282	395	124	148	207
Cottonseed.....	Lb.	1/	0	1,212	1/	0	168
Coffee	Lb.	81	59	123	96	59	131
Hides and skins	No.	--	--	12	1/	1/	76
Tobacco, unmanufactured:	Lb.	26	0	101	20	0	72
Flavoring and coloring syrops.....	Gal.	7	8	4	62	91	47
Food for relief or charity	-	--	--	--	183	1	2/46
Nonfat dry milk	Lb.	3,381	5,569	395	130	522	34
Wheat	Bu.	202	45	0	343	136	0
Other agricultural	-	--	--	--	188	255	330
Total agricultural...	-	--	--	--	6,323	7,365	8,491
Nonagricultural	-	--	--	--	36,958	43,804	48,490
All exports	-	--	--	--	43,281	51,169	56,981

1/ If any, included in other agriculture. 2/ Includes nonfat dry milk, \$41,300.

PROSPECTS FOR AGRICULTURE

The overall output of Lebanese agriculture promises to increase over the next several years. Increases are expected to come chiefly from a continuing change to intensive crop (mainly fruit and vegetables) and livestock (mainly poultry and dairy production). But the increase in overall output is not expected to be spectacular. Not only does Lebanon have the problem of too many people on its limited agricultural land, but the generally low level of income of farmers discourages introduction of modern farming techniques and equipment.

Table 8.--U.S. imports from Lebanon, 1962, 1963, and 1964

Commodity	Unit	Quantity				Value		
		1962	1963	1964		1962	1963	1964
						1,000	1,000	1,000
Agricultural (selected)		Thou.	Thou.	Thou.		dollars	dollars	dollars
Wool, unmanufactures..	Lb.	2,392	4,430	3,229	:	1,553	2,563	2,098
Tobacco, leaf	Lb.	2,020	2,123	1,853	:	1,110	1,371	1,066
Sausage casings.....	Lb.	--	--	--	:	468	759	929
Sheep and lamb skins...	Lb.	804	757	1,803	:	308	247	832
Goat skins	Lb.	96	105	331	:	38	61	133
Sesame seed	Lb.	72	126	387	:	13	23	74
Cumin seeds	Lb.	103	24	206	:	14	3	41
Chickpeas	Lb.	18	12	25	:	4	3	5
Pistachio nuts	Lb.	98	157	0	:	43	67	0
Other agricultural....	-	--	--	--	:	52	61	69
Total agricultural..	-	--	--	--	:	3,603	5,158	5,247
Nonagricultural	-	--	--	--	:	679	1,517	2,989
All imports	-	--	--	--	:	4,282	6,675	8,236

Lebanon depends principally on foreign countries in marketing citrus fruits and apples, while the marketing of fresh vegetables depends mainly on the domestic market and is directly related to the tourist trade. As more land is brought under irrigation, the potential for fruit and vegetable production will increase. Substantial increase in income, however, will depend on the ability of the Lebanese to develop new markets.

Extension of livestock products may be limited by production costs. Competition from foreign poultry and dairy products will probably retard rapid expansion in this area, but increases are expected as the domestic market improves.

Although the government is not expected to introduce tariffs, quotas, or price supports to protect domestic production, it is encouraging the consolidation of landholdings and more efficient agricultural production. Strong traditions and customs, however, make progress slow.



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